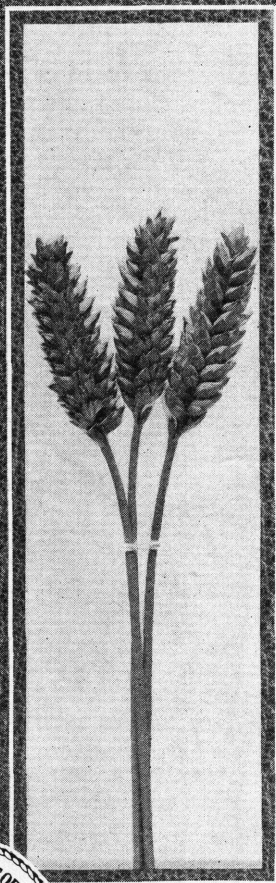


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U. S. DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN No. 1708



VARIETIES
&
CLUB
WHEAT



THE VARIETIES OF CLUB WHEAT differ from others in having short compact heads and small kernels. They are grown almost exclusively in the region west of the Rocky Mountains and are most important in Washington, Oregon, Idaho, and California. They are best adapted to the subhumid sections within these States. About 725,000 acres of club wheat are grown annually in the United States, which is only 1.2 percent of the total wheat acreage.

Owing to their soft texture and low protein content, club wheats are not well adapted for bread making. They are either exported or used in making pastry and biscuit flour.

Twelve distinct varieties of club wheat are grown commercially. Only three, none of which is important, have red kernels. They are grown from both fall and spring sowing. The older varieties are of Chilean origin. Five of the newer varieties are of hybrid origin, resulting from crosses between club and common wheats.

Hybrid 128 is the leading variety of club wheat. It is a white-kerneled winter wheat and is best adapted to the subhumid sections of eastern Washington, Oregon, and northern Idaho. It is very productive, but is also very susceptible to smut.

Albit, a new variety distributed by the Washington Agricultural Experiment Station in the fall of 1926, is resistant to some forms of bunt and is equal to Hybrid 128 in yield in the more humid sections of eastern Washington.

Jenkin is the best-yielding variety in the humid sections and under irrigation. It is a white-kerneled spring wheat, but is grown from both fall and spring sowing in eastern Washington and northern Idaho.

Hybrid 123 is the most important and productive red-kerneled variety and can be grown from both fall and spring sowing.

Hybrid 143, Little Club, Big Club, Redchaff, and several other white-kerneled spring wheats were formerly important, but they are now being replaced by more productive varieties.

This bulletin is a revision of and supersedes Farmers' Bulletin 1303, The Club Wheats.

VARIETIES OF CLUB WHEAT¹

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DESCRIPTION

THE CLUB WHEATS have short, thick, and very compact heads and small kernels. Because of these distinctive characters, they usually are placed in a different division or so-called sub-species (*Triticum sativum compactum*) from the common bread wheats (*T. sativum vulgare*). About 725,000 acres, or 1.2 percent of the wheat acreage of the United States, are annually devoted to the production of club wheats. There are 12 distinct varieties commercially grown; 3 of these have red kernels. Some are grown from both spring and fall sowing, others only from fall sowing. The grain of most of the varieties is soft and inferior to that of other classes of American wheats for making light bread. Club wheats are largely exported to western Europe and the Orient. Flour made from club wheats in the United States is used largely for biscuits and pastry.

Under the official grain standards of the United States the white-kerneled varieties are graded in the subclass (c) western white of the class V white wheat, and the red-kerneled varieties in the subclass (b) western red of the class IV soft red winter wheat.

Not all so-called club wheats are true club varieties. Varieties of common wheat having clavate, or club-shaped, heads (widest at the tip) are sometimes erroneously called club wheats. The heads of most varieties of the true club wheat are not club-shaped but are more or less oblong, that is, as wide at the bottom as at the top.

Surprise, known also as California Club, California Gem, Golden Gate Club, Imperial Club, Silver Club, or Smith Club, and Dicklow

¹ The information in this bulletin is based upon (1) varietal experiments conducted by the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U.S. Department of Agriculture, in cooperation with State agricultural experiment stations; (2) classification studies of all American wheat varieties; (3) a survey of the wheat varieties of the United States, in cooperation with the Bureau of Agricultural Economics, based upon about 10,000 returns from 74,000 questionnaires sent to crop correspondents; and (4) personal observations for several years by the writers in the wheat fields in the States where these varieties are grown.

are white-kerneled common wheats having clavate, or club-shaped, heads, but they should not be confused with the true club wheats. Red Russian, sometimes known as Australian Club, also is a common wheat of the soft red winter class. The wheat known in the South-eastern States as Club, Club Head, Double Head, Stub Head, and by numerous other names, is not a club wheat but is the Fultz-Mediterranean, a variety of soft red winter common wheat. Sonora is sometimes classed as club wheat, because its quality is similar to that of the club varieties, but it is a common wheat and in many characters is very different from the club wheats.

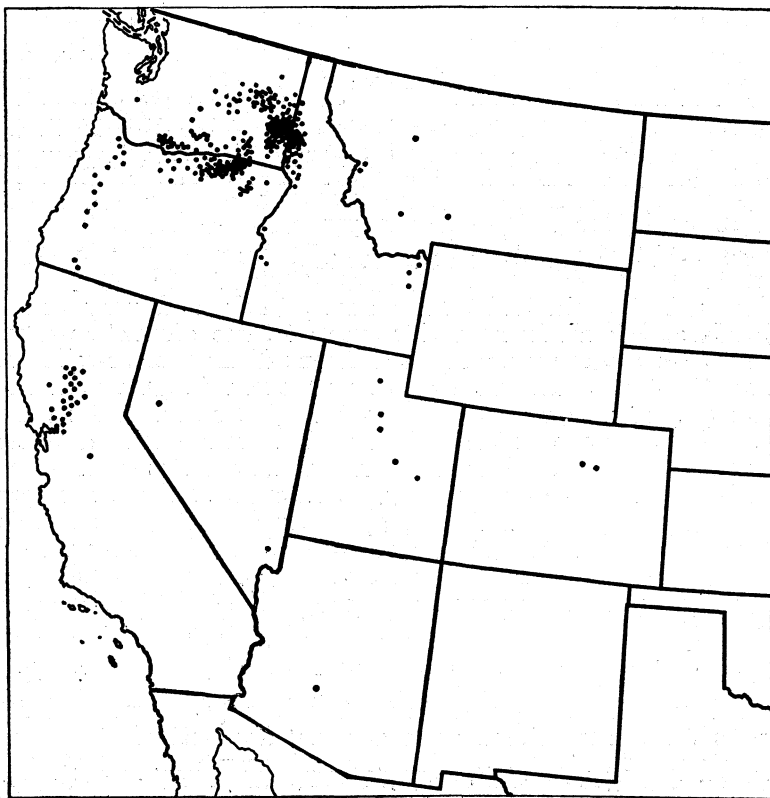


FIGURE 1.—Distribution of club wheats in the United States in 1929. Each dot represents 2,000 acres. Estimated area, 725,214 acres.

WHERE GROWN

Washington, Oregon, Idaho, and California lead in the production of club wheats. In these States club varieties made up 16, 17, 7, and 9 percent, respectively, of the total wheat acreage in 1929. A smaller acreage is grown in Utah and Montana. Only very limited quantities, if any, are grown east of the Rocky Mountains. In these Western States the club wheats are grown principally in the sub-humid sections. Their distribution in the United States is shown in figure 1.

The club wheats are best adapted to the intermountain sections of the Pacific Coast States, where they are now largely grown. This area is characterized by rather mild, rainy winters and dry summers. Club wheat cannot be successfully grown in regions where rainy or humid weather prevails at ripening time, or where stem rust is common. It cannot be grown as a winter wheat in sections having severe winters. Club wheats therefore should not be sown in the Great Plains area or in the eastern United States.

In the intermountain sections of the Pacific Coast States club wheats are well adapted, partly because the chaff and heads are firm or tough and seldom shatter in spite of the dry windy weather. For these reasons club wheats are well adapted to being harvested with the header or combined harvester, as the wheat often is allowed to stand for several weeks after it is ripe before being harvested. The stems of club wheats in general are strong, stiff, and resistant to lodging. The meshes (spikelets) of the short thick heads contain from three to eight kernels and are closely crowded. Owing to this compactness many of the kernels are lopsided or pinched. They also are usually soft and starchy, partly owing to yellow berry. Under favorable climatic conditions club wheats are from medium height to tall, although under dry conditions they may be short. In general, these wheats are taller than the common wheat varieties grown in the Western States.

Owing to the soft texture of the kernels of most of the club varieties and to the fact that these wheats are grown chiefly in sections producing wheat of low protein content, the grain of this class of wheat is not well suited for the production of bread flour under modern commercial bakeshop practice. Much of the club wheat grown in the United States is exported, and the remainder is used largely in making pastry and biscuit flour and in blending with flour of other classes of wheat for breadmaking.

VARIETIES

The older varieties of club wheat grown in the United States are of Chilean origin. They were imported from Chile into California and Oregon during the period from 1850 to 1870, when these States were being settled and developed. Several cargoes of club wheat were received and used for seed in both of these States during this period.

Several new varieties have been developed from these early introductions. Some have been developed from mixtures found in fields. It is probable that some of the new types have arisen from natural crossing with varieties of common wheat.

No fewer than five varieties of club wheat now grown commercially were developed by artificial hybridization at the Washington Agricultural Experiment Station. Four of these varieties are the result of crosses between Little Club and different varieties of common wheat made by W. J. Spillman. Because they retain the characteristics of club wheat they are still classed as such.

For convenience in discussion, the club wheats are divided into five groups, on the basis of head and kernel characters.

Group 1.—Heads beardless; chaff smooth, white or yellow; kernels white: Little Club, Big Club, Hybrid 128, Albit, Hybrid 143, Hybrid 63.

Group 2.—Heads beardless; chaff smooth, white or yellow; kernels red: Hybrid 123.

Group 3.—Heads beardless; chaff smooth, brown or red; kernels white: Jenkin, Redchaff, Bluechaff.

Group 4.—Heads beardless; chaff velvety, white or yellow; kernels red: Coppel.

Group 5.—Heads bearded; chaff smooth, brown or red; kernels red: Mayview.

**GROUP 1.—HEADS BEARDLESS; CHAFF SMOOTH, WHITE OR YELLOW;
Kernels White**

The most important of the club wheat varieties are included in group 1. Four of the six varieties are spring and two are winter wheats.

LITTLE CLUB

Little Club, or Small Club, is a spring wheat but is often grown for fall sowing. It has longer and more slender heads and kernels than the other club varieties. The heads of Little Club usually are 2 to 2½ inches long and oblong in shape (fig. 2, A). The plants are tall, erect, and late.

The origin of Little Club wheat is not definitely known, but the variety is believed to have been introduced from Chile. It probably was one of the first wheats grown in the Columbia Basin section of Oregon, and it is believed to have been grown also in California at an early date. It is reported to have been grown in Yolo County, Calif., as early as 1878. It was formerly the leading variety in eastern Oregon and Washington, but in recent years has been largely replaced by more productive varieties.

Little Club produces fair yields under favorable conditions, but it is not well adapted to districts where the rainfall is limited. In general, it could be advantageously replaced by other varieties of club or common wheats. Several varieties of common white wheat will outyield Little Club when fall sown in the Sacramento Valley of California and also when spring sown in Oregon and Washington. In the latter-named States some true winter wheats usually produce higher yields than does Little Club from fall sowing. Among these is Hybrid 128, a club wheat.

BIG CLUB

Big Club—known also as Big Four, Chile Club, Crookneck Club, Montezuma Club, and Salt Lake Club—differs from Little Club in having wider, shorter, and thicker heads and wider and more rounded kernels (fig. 2, B). Its chief characteristics are the curves and crooks in the stem immediately below the head. For this reason it is often called Crookneck Club. In spite of the curves in the stems, the heads of Big Club are erect or nearly so.

This variety is reported to have been introduced into Oregon from Chile about 1870. However, it was grown in California as early as 1866 and was first known as Chile Club and as Oregon Club. It was formerly grown extensively in the Pacific Coast States, but only about 4,000 acres were grown in 1929. Big Club is still grown in scattered areas in California, Idaho, Montana, Oregon, Utah, and Washington.

The yields of Big Club usually have been lower than those of Little Club and of most other varieties in nearly all sections where it is grown. This wheat should be dropped from cultivation.

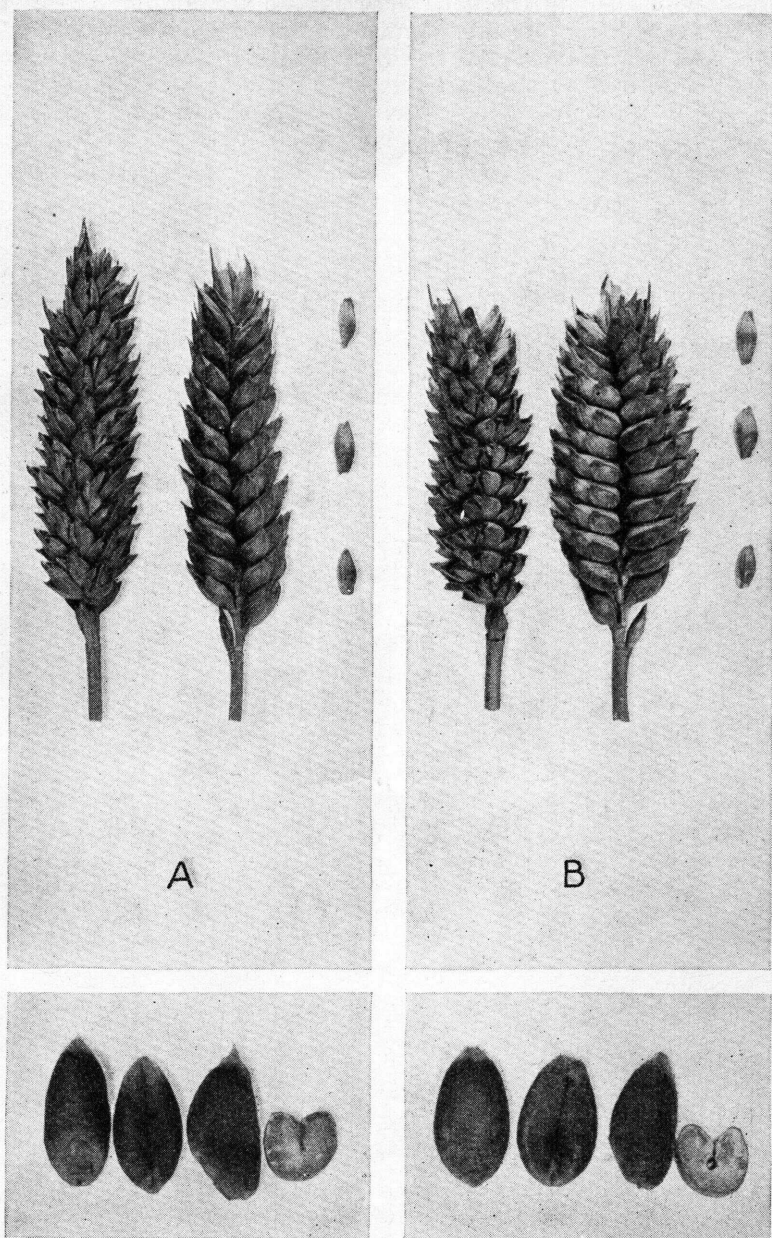


FIGURE 2.—Heads, chaff, and kernels of (A) Little Club and (B) Big Club. Heads and chaff, natural size; kernels, three times natural size.

HYBRID 128

Hybrid 128 (Washington Hybrid No. 128) is a winter wheat and cannot be successfully grown from spring sowing. The heads of this variety (fig. 3, A) can scarcely be distinguished from those of Big

Club. The kernels of the two varieties also are similar, except that those of Hybrid 128 are more pinched and irregular in shape. The plants of Hybrid 128 are of medium height. The variety is very susceptible to bunt or stinking smut.

It was originated at the Washington Agricultural Experiment Station from a cross between Jones Fife, a soft red winter wheat, and

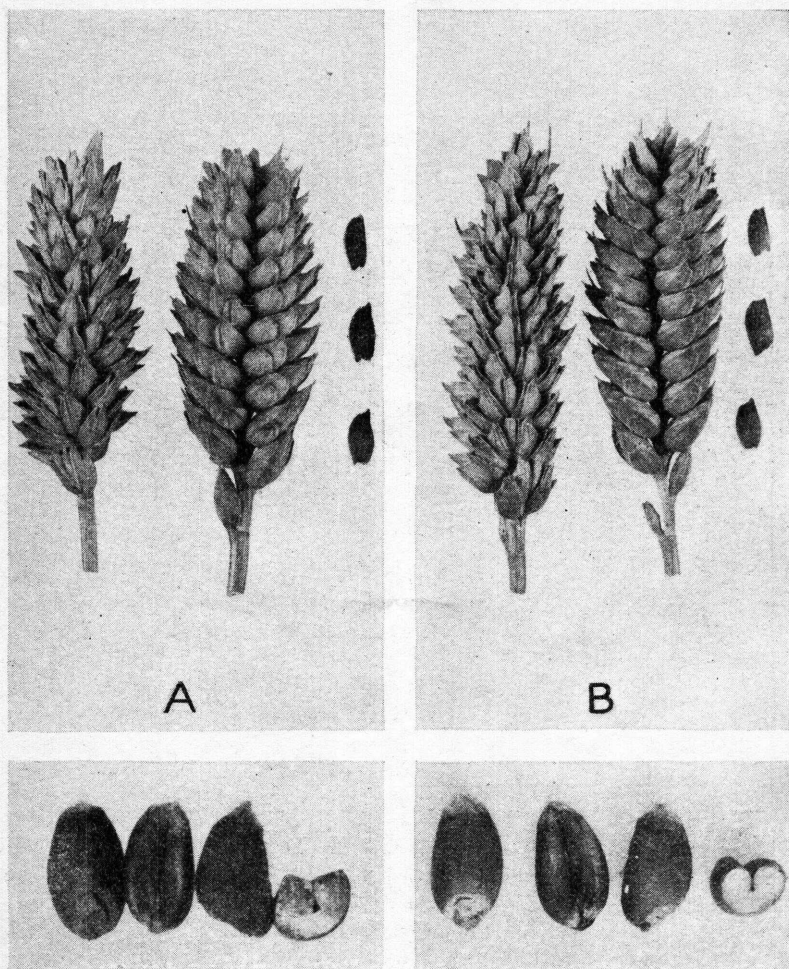


FIGURE 3.—Heads, chaff, and kernels of (A) Hybrid 128 and (B) Albit. Heads and chaff, natural size; kernels, three times natural size.

Little Club. The cross was made in 1899 by W. J. Spillman. After being selected and tested for 8 years, this new winter club wheat was distributed to farmers by the Washington station. It has since become the most important variety of club wheat.

Hybrid 128 is grown extensively in the southeastern part of Washington and in adjoining districts in Idaho and Oregon. It is most important in Whitman and Walla Walla Counties, Wash., and in

Umatilla County, Oreg. It was estimated that more than 350,000 acres were grown in 1929, but since then its acreage has decreased somewhat.

This variety is being replaced in Whitman and Columbia Counties, Wash., by Albit, which is resistant to some forms of bunt, and in Umatilla County, Oreg., and Walla Walla County, Wash., by Federation, a common white spring wheat. Federation has shorter, stiffer straw and is more productive than Hybrid 128 in sections where it does not winterkill when fall sown. The distribution of Hybrid 128 in 1929 is shown in figure 4.

ALBIT

Albit is very similar in plant characters to Hybrid 128, but differs in being resistant to some forms of bunt. The mature heads (fig. 3, B) are less harsh to the touch than those of Hybrid 128. It was developed by the Washington Agricultural Experiment Station from a cross made by E. F. Gaines in 1920 between Hybrid 128 and White Odessa. The selection, which later was named Albit, was made in 1923 and released for commercial distribution in the fall of 1926.

It was estimated that this variety was grown on nearly 80,000 acres in 1929; it is now extensively grown in Whitman and Columbia Counties, Wash. The distribution of Albit in 1929 is shown in figure 5. It is best adapted to the humid sections of eastern Washington, where its yields are equal to those of Hybrid 128. Outside of this section, in areas where a club wheat is desired, Hybrid 128 seems to be better adapted than Albit, which is a true winter wheat and will not head from spring seeding.

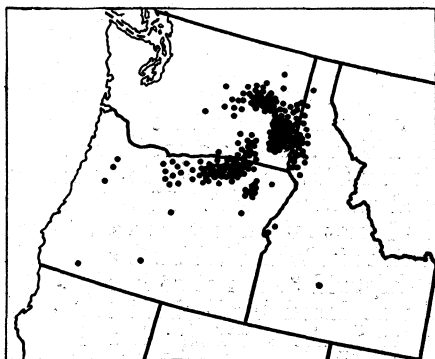


FIGURE 4.—Distribution of Hybrid 128 wheat in 1929. Each dot represents 1,000 acres. Estimated area, 357,000 acres.

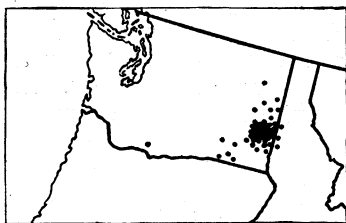


FIGURE 5.—Distribution of Albit wheat in 1929. Each dot represents 1,000 acres. Estimated area, 78,000 acres.

HYBRID 143

Hybrid 143 (Shot Club) has very short, blunt, blocky heads and small, short, white kernels. It is a spring wheat but is more or less intermediate in its habit of growth and is grown from both fall and spring sowing. When sown late in the spring it spreads out on the ground like a winter wheat; heading and ripening, therefore, are somewhat delayed and yields are comparatively poor. The plants are of medium height.

This variety was originated at the Washington Agricultural Experiment Station from a cross made in 1899 between Little Club and White Track, the latter a common white winter wheat. It was distributed by the Washington station in 1907.

Hybrid 143 is grown sparingly in several counties in southeastern Washington and adjacent Idaho. About 10,000 acres of the variety were grown in 1929. It usually does not yield so well as do other varieties, being outyielded by Hybrid 128 when fall sown and by Jenkin, as well as several common varieties, when spring sown. Hybrid 143 could profitably be replaced by more productive varieties.

HYBRID 63

Hybrid 63, sometimes called Turkey Hybrid, differs from the other club wheats in having harder kernels. The heads resemble those of Hybrid 143 in shape, but the outer chaff (glumes) of each mesh is longer and narrower. It is a spring wheat, although it usually is fall sown. The plants are of medium height.

This variety was produced at the Washington Agricultural Experiment Station by crossing Little Club and Turkey, the latter a hard red winter wheat. Hybrid 63 was distributed to farmers in 1907. It is not an important variety and is grown only to a very limited extent in Walla Walla County, Wash., and Wasco County, Oreg.

Hybrid 63 is not so hardy as the true winter varieties and should be replaced by Hybrid 128 or better-adapted varieties of winter wheat. As a spring wheat it does not yield so well as do several of the common white wheats.

GROUP 2.—HEADS BEARDLESS; CHAFF SMOOTH, WHITE OR YELLOW;
Kernels RED

Group 2 includes only one commercial variety.

HYBRID 123

Hybrid 123 is usually designated commercially as Red Hybrid or Red Walla and is graded in the subclass (b) western red under the official grain standards. It is a spring wheat and has rather short beardless heads with smooth white chaff and small red kernels. The kernels when free from yellow berry are semihard, but, as commonly grown, they usually appear starchy. Hybrid 123 was originated from a cross between Little Club and Jones Fife made in 1899 by the Washington Agricultural Experiment Station and was first distributed in 1907. About 26,000 acres were grown in Klickitat and Whitman Counties, in eastern Washington, in 1929. It is fairly high yielding and in some sections outyields Hybrid 128, but its market price is usually lower.

GROUP 3.—HEADS BEARDLESS; CHAFF SMOOTH, BROWN OR RED; KERNELS
WHITE

The club wheats of group 3 are tall and have midsized to large heads for club varieties, and strong stems. In general, they are adapted to districts having an annual precipitation of more than 15 inches. Jenkin is the leading variety.

JENKIN

Jenkin (Jenkin's Club) is somewhat similar to Little Club, except that it has brown or red chaff and shorter, wider kernels (fig. 6, A).

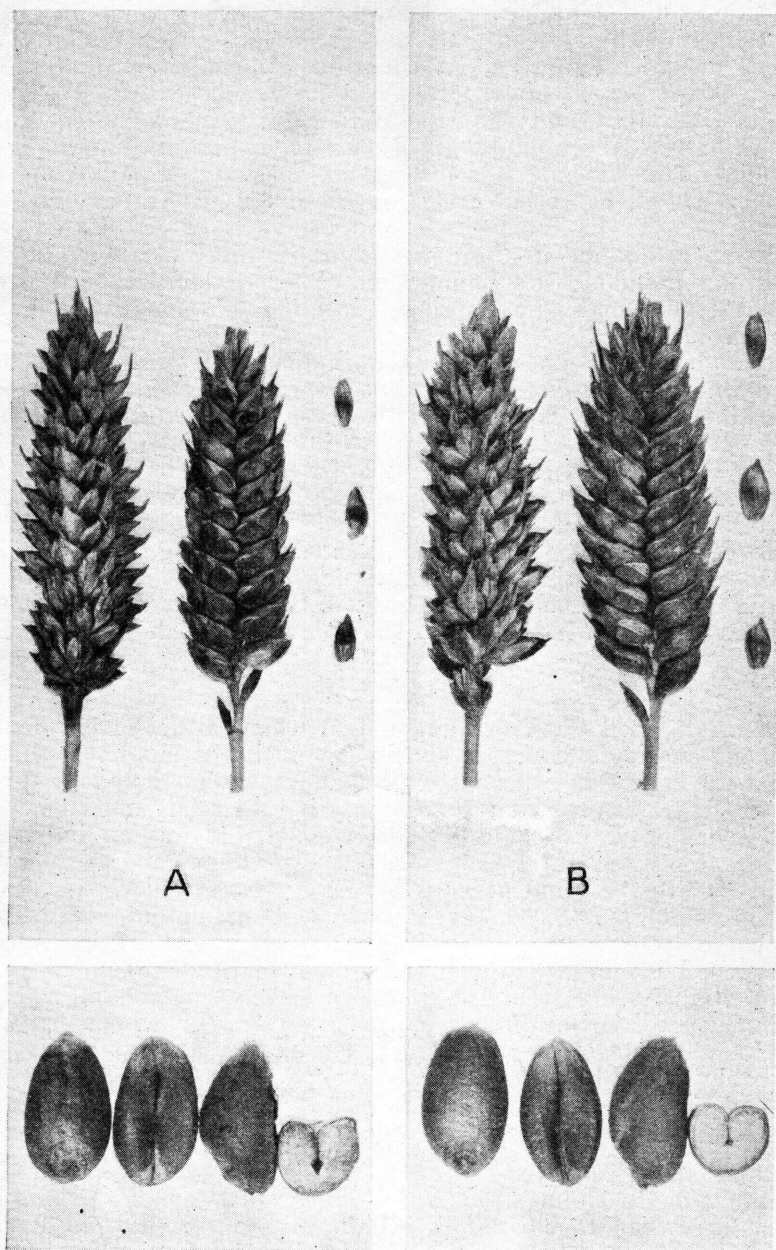


FIGURE 6.—Heads, chaff, and kernels of (A) Jenkin and (B) Redchaff. Heads and chaff, natural size; kernels, three times natural size.

The heads are oblong and about 2 inches in length. The plants are very tall and late, taller than those of most common wheats grown in the United States. It is a spring wheat but is often fall sown.

The origin of Jenkin is not known. The variety has been grown in eastern Washington at least since 1895 and in the Walla Walla Valley of Washington and in Umatilla County, Oreg., since 1900. About 90,000 acres were reported in 1929 in southeastern Washington, in Umatilla County and the Willamette Valley of Oregon, and in northern Idaho. Jenkin is grown from both fall and spring sowing. The acreage in southeastern Washington and Umatilla County, Oreg., has been largely replaced by Federation in recent years.

Jenkin is adapted to irrigated lands in the Yakima Valley of Washington and to the subhumid and cooler sections of southeastern Washington, northwestern Idaho, and the Willamette Valley of Oregon.

It produces high yields under the conditions existing in these districts whether sown in the fall or in the spring. Under less favorable conditions Jenkin has been replaced as a winter wheat by Hybrid 128 or Turkey, the latter a hard red winter wheat. When Jenkin is spring sown it is often injured by frost, drought, or hot winds because of its late maturity. It is an excellent hay wheat because of its tall, rank growth.

Hood, a selection from Jenkin, has slightly longer heads, taller straw, and is somewhat more winter hardy, and has been developed by the Oregon Agricultural Experiment Station. It was distributed in western Oregon in the fall of 1930.

REDCHAFF

Redchaff (Red Chaff or Oregon Red Chaff) differs from Jenkin in being shorter and earlier and in having heads more club-shaped and with lighter brown chaff (fig. 6, B). Although it is a spring wheat, Redchaff often is fall sown. It is rather tall and late.

The origin of Redchaff is undetermined. It was an important variety in sections of the Columbia Basin of Oregon and Washington from 1907 to 1920, and perhaps for many years earlier. In 1929 it was grown on only 8,000 acres in Oregon, Washington, Nevada, and Utah.

Redchaff is adapted to about the same conditions as Jenkin, but, being slightly shorter and earlier, can be more successfully grown in somewhat drier localities or on poorer soils. It has not produced very high yields in comparative experiments, and its cultivation probably should be discontinued.

BLUECHAFF

Bluechaff (Blue Chaff Calvert Club) differs from Redchaff in having a distinct bluish powder or bloom on the chaff and is somewhat later than Redchaff. Bluechaff was originated from a plant found in a field of wheat by A. C. Calvert, of Junction City, Oreg., in 1897. From this plant, which had seven heads, the variety was increased until 1904, when it was first distributed in the upper Willamette Valley of Oregon. It is now grown only on a small acreage in southwestern Oregon.

Little is known about the yields or milling quality of Bluechaff as compared with those of other varieties grown in the same sec-

tions. Jenkin and several varieties of common wheat are more promising than Bluechaff in western Oregon.

**GROUP 4.—HEADS BEARDLESS; CHAFF VELVETY, WHITE OR YELLOW;
KERNELS RED**

Coppei is the only variety in group 4 that is grown commercially.

COPPEI

Coppei (Coppei Club) is easily distinguished from most other club wheats by its velvety chaff. It is a winter wheat, but if spring sown will mature late in the season. The variety was originated from a plant found in 1907 by J. L. Harper, of Waitsburg, Wash., in a field of Little Club near Coppei Creek, 3 miles south of Waitsburg.

It was grown and increased until 1911, when it was first distributed. Its appearance indicates that Coppei may be the result of a natural cross between Little Club and Jones Fife, the latter being a soft red winter common wheat having velvety chaff.

Coppei was reported in 1929 only from Whitman and Spokane Counties in southeastern Washington, where about 3,000 acres were grown. Since 1929 its acreage has decreased.

It yields nearly as well as Hybrid 128, but it generally has a lower market value and is graded in the subclass (*b*) western red under the official grain standards.

**GROUP 5.—HEADS BEARDED; CHAFF SMOOTH, BROWN OR RED; KERNELS
RED**

Group 5 is represented by a single variety, Mayview, which is bearded.

MAYVIEW

Mayview has bearded, club-shaped heads with smooth brown chaff and soft red kernels. The stems usually are white or yellow at maturity, but may show a trace of purple on the lower joints. The plants are late and of medium height. It is a spring wheat but usually is grown from fall sowing.

This variety was originated from a selection found in a field of Goldcoin or Fortyfold wheat near May View, Wash., about 1911 or 1912. It was named Mayview by E. F. Gaines, cerealist of the Washington Agricultural Experiment Station in 1917, when he first observed commercial fields of the variety in Washington.

The variety probably originated as a result of a natural field cross between a club variety and a bearded variety of common wheat. Wheat plants similar to Mayview have been found as mixtures in fields in Idaho and Montana.

For a few years Mayview was grown on a large acreage in the vicinity of its place of origin, but because of its bearded heads it did not become popular. It has yielded less than Hybrid 128, and apparently has largely disappeared from cultivation.

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